

IX.—*Note on the Lower Jaw of Stereognathus ooliticus, Charlesworth.* By Dr. BRANISLAV PETRONIEVICS.

[Plate III.]

IN 1854 Charlesworth announced the discovery of the fragment of jaw of a new mammal, to which he gave the name *Stereognathus*, and which afterwards, in 1857, Owen described and figured. In 1887 Marsh expressed doubts about the nature of the fragment, suggesting the possibility of its being an upper jaw instead of a lower one, as was held unanimously before\*.

To decide the question, I took, while in London at the end of last year, the specimen from the Museum of Practical Geology, where it is preserved, to the Natural History Museum, where it was further prepared by F. O. Barlow according to my directions.

When I saw the specimen for the first time, and compared fig. 3 of the middle tooth in Owen (1857) with the root of this tooth, I was struck by the inexactness of Owen's figure (fig. 29, pl. i. in Owen, 1871, is better in this respect). Owen's figure shows a longitudinal division of the root, whilst the magnifying-glass shows no trace of such a division, and the root of the other side of the same tooth, now uncovered, confirms this lack of division †. But the newly prepared hindermost tooth shows on the hinder side three distinct roots (comp. Pl. III. fig. 4,  $\alpha$ ,  $\beta$ ,  $\gamma$ ), corresponding to the three longitudinal rows of cusps. So that we have in *Stereognathus* only a transverse division of molar roots.

Pl. III. fig. 1 shows the outer side of the fragment. As its vertical diameter is greater behind than in front, we must conclude that the deeper end is the hind end of the jaw, which, accordingly, is a left one. This state of things was rightly referred to by Owen (comp. Owen, 1857, p. 2), but he

\* Comp. Marsh, O., 1887, p. 343: "None of the known Mesozoic mammals appear to have been truly herbivorous. *Stereognathus*, which has been considered as such, from its molar teeth, cannot fairly be regarded as evidence, since it was based, not upon part of a lower jaw, as described by Owen, but upon a fragment, evidently the posterior portion of the maxillary, and the teeth resemble the superior molars of some insectivorous forms." Comp. also Marsh, 1891, p. 613.

† In his 'Palæontology,' 2nd ed. 1861, p. 345, Owen says expressly: "The outer side of the crown (fig. 115, *b*), supported by a bifurcate fang which contracts as it sinks into the socket, shews . . ."

hesitated to affirm it categorically. The shaded part below indicates the lower surface of the jaw, which was already uncovered before the new preparation.

Pl. III. fig. 2 shows the newly prepared inner side of the fragment, which sets beyond any doubt that this fragment is a lower jaw. Its lower edge is wholly uncovered in the front part, whilst a narrow band of bone remained covered behind. The --- line shows the position of the lower edge in this hind part in concordance with the lower edge in fig. 1. A faint groove seems to occur in the front part, possibly a trace of the mylohyoid groove.

Pl. III. fig. 3 shows the upper surface of the three molar teeth. It is probable that in front of them there were three more teeth. As the hindmost molar ( $m_3$ ) seems to be somewhat smaller than the middle one, so it is probable that it represents the last molar of the jaw. The valleys between the obliquely placed cones are especially marked in this figure. The grooves between the middle and inner cones of  $m_2$  and  $m_3$ , which are interrupted only where the edges of the oblique valleys meet one another, are marked in the figure as empty spaces. These grooves are clearly distinct from the oblique valleys between the cusps, but narrow in comparison with the cusps.

To the detailed description of the middle tooth by Owen (1857) I must add some corrections. Our fig. 5 (Pl. III.) shows, when compared with fig. 3 of Owen, that there is no such prominent basal cusp on the outer side of this tooth as is marked in Owen's figure\*, and our fig. 6 shows, compared with Owen's fig. 4, that its inner cones are not "slightly inclined forwards" (comp. Owen, 1857, p. 2), as it is quite wrongly indicated by this last figure of Owen. Fig. 7 shows the two middle cusps of this tooth seen from the inner side that have not been figured by Owen. The oblique position of the cusps is quite clearly indicated in this figure. In figs. 5 and 6 the cement that coats the roots is shaded.

I conclude this paper with a remark concerning the probable direction of the motion of lower jaw in *Stereognathus*. According to the mechanical theory of teeth-forms proposed by Ryder and Cope, the oblique position of the molars in some rodents (upwards and forwards for the lower and downwards and backwards for the upper molars) is due to

\* Unfortunately the hinder cusp of this tooth, shown so conspicuously in fig. 3 of Owen, has been broken away since Owen's time.

the motion of its lower jaw from before backwards\*. If this mechanical explanation is a right one, then we may conclude that the oblique position of molar cusps in *Stereognathus* (and probably also in *Meniscoëssus*) is due to a motion of its lower jaw from backwards forwards, opposite to the direction in rodents.

Finally, I desire to express my thanks to Dr. A. Strahan and Dr. Kitchin, of the Museum of Practical Geology, and to Dr. Woodward, of the British Museum, for the loan of the new preparation. Also to Dr. Andrews, of the British Museum, for some valuable help.

#### Literature on *Stereognathus*.

1. CHARLESWORTH, E. "Notice on new Vertebrate Fossils," in Report of the British Association, 1854, Transactions, p. 80.
2. OWEN, R. "On the Affinities of the *Stereognathus ooliticus* (Charlesworth), a Mammal from the Oolitic Slate of Stonesfield," in Quart. Journ. Geol. Soc. Lond. vol. xiii. 1857, p. 1-11.
3. OWEN, R. 'Palæontology,' 2nd ed. 1861 ("On *Stereognathus*," pp. 345-349).
4. OWEN, R. 'Monograph of the Fossil Mammalia of the Mesozoic Formations,' 1871 (on *Stereognathus*, pp. 18-20).
5. MARSH, CH. O. "American Jurassic Mammals," in Amer. Journ. Sci. vol. xxxiii. 1887, pp. 327-348 (on *Stereognathus*, p. 343).
6. OSBORN H. F. "On the Structure and Classification of the Mesozoic Mammalia," in Journ. Acad. Nat. Sci. Philad. 1888, pp. 186-264 (on *Stereognathus*, p. 221).
7. MARSH, CH. O. "Notes on Mesozoic Mammalia," in Amer. Nat. vol. xxv. 1891 (on *Stereognathus*, p. 613).
8. GOODRICH, E. S. "On the Fossil Mammalia from the Stonesfield Slate," in Quart. Journ. Micr. Sci. vol. xxxv. 1894, pp. 407-432 (on *Stereognathus*, p. 424, with the note of E. Ray Lankester on another lost fragment of jaw of *Stereognathus*).

#### EXPLANATION OF PLATE III.

##### *Stereognathus*, Charlesworth.

Fig. 1. The outer side of the fragment of lower jaw, somewhat mutilated in front.

Fig. 2. The inner side of the same; *mg.*, mylohyoid groove.

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\* Comp. Ryder, T. A., "On the Mechanical Genesis of Teeth-forms," in Proc. Acad. Sci. Philadelphia, 1878, especially fig. 8 *b, f*, p. 66, and Cope, E. D., "The Mechanical Causes of the Origin of the Dentition of the Rodentia," in 'American Naturalist,' vol. xxii. 1888, p. 9 *s.* and p. 12 (also his 'Primary Factors of Organic Evolution,' 1904, pp. 349-351 and p. 325).

*Fig. 3.* Upper surface of the three molar teeth. The oblique valleys between the cusps are shaded.

*Fig. 4.* The three transverse roots of the hindmost molar.

*Fig. 5.* The outer side of the middle tooth, with the front cusp (*a*) and hind cusp (*b*).

*Fig. 6.* The inner side of the middle tooth, with the front cusp (*a*) and hind cusp (*b*).

*Fig. 7.* The two middle cusps (*a* and *b*) of the middle tooth seen from inner side and partly from above.

X.—*Variation in the Prothoracic Spines of Dactylispa xanthopus, Gestro.* By S. MAULIK, B.A. (Cantab.), F.E.S.

IN the 'Természetráji Füzetek,' vol. xxi. 1898, p. 262, Dr. Gestro described this species from one example which now exists as the type in the National Museum at Budapest. This particular individual was taken at Darjeeling. In examining the collection of Hispinæ belonging to the Indian Museum, Calcutta, I have come across a group of seventeen examples collected by Atkinson at Jalapahar, Darjeeling. They were all mounted on one card. Among this lot I find one example that answers Dr. Gestro's description well—viz., the insect is black and shining, the abdominal segments and the legs are yellow, the colour of the basal five joints of the antennæ is different from that of the remaining apical joints, each side of the prothorax has a group of three spines which may be regarded as having a common base. The front margin has a pair of double spines. The other examples of the same lot before me agree with the description in the main—viz., the general form of the insect, the coloration (black, with the abdominal segments, antennæ, legs, and mouth-parts yellow), but differ in the following structures:—

- (1) On the front margin of the prothorax there are a pair of triple spines instead of double.
- (2) On each side of the prothorax there is a group of four spines instead of three. The latter are arranged in two ways—in some specimens the four spines have a common base, in others the fourth may be regarded as standing separate.

In a note published in the 'Annales Musei Nationales Hungarici,' 1907, p. 72, Dr. Gestro identifies the examples